

draft of 37 feet. Underkeel clearances of 1 to 2 feet were a consideration. The bulk carrier was single screw and used tug assistance at the entrance to Big Bend Channel and in the turning basin. The ITB was twin screw and had a bow thruster. Design winds were variable from the north averaging 15 knots.

Model Results. The WES report is in appendix C. Pilots, licensed to handle ships in the Big Bend Channel, assisted with the development and evaluation of the plans and design alternatives. The model included a channel depth of 40 feet below mllw which provided a reliable variance of +/- 2 feet for that design condition. The channel width of 200 feet was the main design concern for evaluation.

The model considered an additional width of 50 feet necessary for navigation. Testing looked at placing the width all on one side or an equal amount on both sides. Testing in addition to the existing 200 feet. WES recommended the alternative of widening all on the north side (Plan B) of the channel. That is the selected plan for implementation.

Test results also recommended a larger widener between the entrance and inner channel on the southwestern side of the turning basin at Buoy 10. That change was to provide more maneuvering room and clearance for tug assistance in making that turn in the turning basin. That recommended modification also enlarged the turning diameter to a diameter of 1,200 feet.

The turn between C Cut on the main Tampa Harbor channel and the Big Bend entrance channel was also a problem for vessels. The turn caused vessels to swing outside the western bottom boundary of the main ship channel at the junction of C and A Cuts. Depths in that area where the ships leave the channel are not a problem and no groundings occur as a result. To avoid leaving the channel, the recommendation is to move the channel markers to the west and provide more channel width in that area.

EXCAVATION

The geotechnical analysis in appendix A indicates the new work dredging involves mainly sand, silt, clay, shell, and some rock in the excavation. Available subsurface investigations indicate a considerable amount of fine material comprising as much as 40 to 50 percent of the total project excavation. The selected plan is for a required dredging depth of 43 feet (includes 2 feet of advanced maintenance) over the enlarged bottom area of the existing channel. Removal to that depth involves the excavation of about 3,238,000 cubic yards (CY) of material. A 1-foot allowable overdepth for dredging inaccuracies could result in a gross yardage of 3,477,000 CY.

DISPOSAL

Disposal island 3D is the primary disposal area for all excavated material. The disposal process provides a natural separation of the fine material from the coarser material suitable for construction. Approximately 3.24 to 3.48 million cubic yards (CY) of material to be excavated is to go into the disposal area from initial construction of the selected plan. That quantity includes an excavation allowance of 1 foot below the required depth (project depth plus required overdepth for advanced maintenance) to allow for dredging inaccuracies.

The material is to go into the southern end of the disposal island. The weirs for overflow waters are on the northern end. The coarse material is likely to settle in the southern end along with 8 percent of the total volume that is likely to be fines. Estimating fines at 45 percent of total excavation volume, the remaining 37 percent is likely to move to the northern end near the weirs. Suitable construction material settling on the southern end is estimated at 2.0 to 2.2 million CY. 1.7 million CY is necessary for dike construction on disposal island 3D.

DIKES

Placement of 3.2 to 3.5 million CY of material into disposal island 3D is possible only with construction of higher dikes. Assuming no existing capacity is available on that island, a dike height increase of 7 feet is necessary to hold 3.7 million CY of material. The existing dike is at an elevation of 20 feet above mean low water. The additional 7 feet requires 582,000 CY of suitable construction material plus about 35,000 CY for dike repairs on the southwest corner. The repair is maintenance work and not a cost for the project. The repair is necessary before prior to any increase the height. The material on the southern end of disposal island 3D has an estimated 1.7 million CY of suitable material. Sufficient material is available on disposal island 3D to raise the dike height and make repairs.

Foundation conditions limit the ultimate dike height on disposal island 3D to an elevation of 40 feet above mean low water. Construction of the dike to that elevation requires about 3.34 million CY of suitable construction material. Dike repairs to the southwest corner require another 35,000 CY for repairs to the southwest corner. About 1.675 million CY of additional suitable material is necessary with the 1.7 million CY in 3D to obtain the maximum height. The most cost efficient source of material is from the dredging of navigation features at Big Bend. The material also needs to go into disposal island 3D to separate most of the fines from coarse materials.

WEIRS

Disposal island 3D has the potential to accommodate the material from the initial construction. The existing weirs are usable with some repairs. Costs are in the estimates to repair and raise the existing weirs consistent with dike construction for disposal of the Big Bend dredged material.

ENVIRONMENTAL CONSIDERATIONS

The selected plan considers the potential impact that construction and disposal activities can have on bird nesting and manatees in the area. To avoid impacts to bird nesting on disposal island 3D, the construction schedule is to exclude disposal operations during the bird nesting season from 1 April-31 August. The construction contract for dredging will include the following to protect the manatees:

- Standard Federal and State manatee protection conditions;
- Provision for a trained biologist, approved by the Fish and Wildlife Service and/or Florida Department of Environmental Regulation, to be aboard the dredge;
- No dredging at night during the winter manatee window with the use of a clamshell dredge to do the excavation; and
- Placement of propeller guards on the auxiliary vessels moving supplies and personnel between the dredge and shore.

Environmental interest indicated that Sunken Island was a higher priority than Whiskey Stump Key. However, the amount of suitable material available will likely determine the best plan. Filling the holes at Whiskey Stump Key raises the bottom depths to an elevation consistent with the existing bottom in the surrounding area. The higher bottom elevation creates an estimated 53 acres of habitat for the marine environment.

The use of the dredged material to benefit the environment has a high priority in the Tampa Bay area. The selected plan includes the placement of all dredged material onto disposal island 3D for raising the dikes. If suitable material is available after required dike construction, the excess would be available for improvements to the environment. Consideration at that time would determine the most feasible use of the material based on available authorizing legislation.

PRECONSTRUCTION PLANNING

Additional hydraulic and subsurface information will be obtained during preconstruction planning to more accurately define the conditions for construction. Upon completion of plans and specifications, a contract would be advertised and awarded for project construction.

CONSTRUCTION

Assuming funding availability, the estimated construction time is about 4 months. During that period after contract award, excavation and disposal is to involve approximately 3.2 to 3.5 million cubic yards of material to modify existing channel conditions. To the extent possible, the construction is to avoid the nesting season of migratory birds. If construction during the bird window is unavoidable, provisions satisfactory to the U.S. Fish and Wildlife Service and State environmental agencies would be made to accommodate any nesting pairs. Standard precautionary measures are to be taken for locating and minimizing possible impacts to any manatees that happen into the area during the dredging operations.

Project construction is expected to involve the following:

- Excavation of material from the project channels, turning basin, and berthing areas with placement of the material in disposal island 3D.
- Installation of appropriate navigation aids by the U.S. Coast Guard along the project waterways.

The estimated costs for the project anticipate the use of a hydraulic dredge with a cutterhead to excavate material for larger channel and basin conditions. The excavated material is to be pumped through a pipeline to disposal island 3D.

NAVIGATION PLAN FIRST COST

Table 10 contains the major items of the selected plan for navigation improvements at Big Bend. The excavation quantity is for construction of the required project depth of 41 feet plus 2 feet of advanced maintenance. Excavation of berthing areas to the same depths and bulkhead modifications to enable those depths are separate from the channel and turning basin dredging because they are sponsor costs. Attachment 3 of appendix A provides a breakdown of cost but does not include the bulkhead estimate. That estimate came from area interests. The dredging costs include a 1 foot allowable overdepth for dredging inaccuracies.

TABLE 10
SELECTED PLAN ESTIMATED TOTAL FIRST COST

ITEM	COSTS
Mobilization and Demobilization - Hydraulic Dredge	\$861,000
- Dike Equipment	80,000
Excavation - Hydraulic Dredge with Upland Disposal	4,097,000
Berthing Area - Hydraulic Dredge with Upland Disposal	517,000
Aids to Navigation	438,000
Turbidity and Manatee Monitoring	87,000
Disposal Area Preparation - Dike construction	1,644,000
- Weir work	152,000
Bulkhead modifications - coal terminal	2,133,000
Preconstruction Engineering and Design	595,000
Construction Management	744,000
TOTAL FIRST COST	\$11,348,000

OPERATION AND MAINTENANCE

A required overdepth for advanced maintenance increases the time between maintenance cycles to approximately 9 years. The disposal area for maintenance material is disposal island 3D. Higher dikes will be necessary to accommodate the maintenance material from Big Bend and other areas that use the island for disposal of shoal material such as the Tampa Harbor Main Shipping Channel.

Annual Shoaling. Dredged material from maintenance of the Big Bend Channel is to be placed in disposal island 3D. That island also has other shoal material sources besides Big Bend as discussed in appendix F. The other sources have an estimated potential shoaling rate which combined with Big Bend forms an annual estimate in the future as follows:

3D Shoal Sources	Annual amounts in 1,000's		
	1998	1999	2000-2047
Other Tampa Harbor projects	280	280	280
Big Bend project	80	80	80
Alafia River project	-	-	65
TOTAL	360	360	425

Based on the above annual shoaling rates, the estimated Big Bend portion ranges from 22.2 percent in 1998 and 1999 to 18.8 percent from the year 2000 into the future.

Disposal Capacity. An analysis of capacity in disposal island 3D is in appendix F. That island can accommodate all the construction material from Big Bend with an increase in dike height of about 7 feet assuming no existing capacity. However, that island is primarily a disposal area for maintenance material from the Tampa Harbor Federal project. Further increases in dike height will be necessary to enlarge the capacity for future maintenance of the harbor.

An increase in dike height of 20 feet provides an added capacity for future maintenance disposal. Determining that capacity involves an accounting for material coming from Big Bend not used in the dike construction as well as the existing capacity. The material not used in the dike construction reduces the capacity an estimated 1.56 million cubic yards (3,238,000 CY - 1,675,000 CY). The following is an approximate estimate of capacity within the disposal area after a 20-foot increase in dike height:

<u>Million CY</u>	
20 feet of dike -----	8.6
Estimated capacity - 1997 ----	0.3
Dike material from inside 3D -	3.4
Big Bend material reduction	<u>(1.6)</u>
TOTAL CAPACITY -----	10.7

The above potential capacity is for shoal material from Tampa Harbor and Big Bend. The Tampa Harbor project has an estimated shoaling for disposal of about 345,000 cubic yards a year. The Big Bend selected plan has maintenance of about 80,000 cubic yards a year. The estimated future shoaling rate of 425,000 cubic yards a year into disposal island 3D results in a life expectancy of about 25 years with the inclusion of half the annual maintenance from Alafia River. Any removal of material from the disposal island in the future for beneficial environmental uses can extend the life of that area even more. Big Bend, as part of the Tampa Harbor project, has a long term management plan for disposal of shoal material from maintenance work.

ECONOMIC ANALYSIS

The economic analysis consists of an evaluation of the average annual equivalent (AAEQ) costs and benefits for the selected plan. The benefits come from the movement of coal, phosphate rock, and phosphate chemicals on the deeper depth channel of 41 feet. Development of the benefits is in appendix B. The AAEQ benefit from the movement of coal on deeper draft vessels is an estimated \$2,179,000 and for the phosphate rock and chemicals \$1,550,000. Table 11 provides the total benefit for all the channels and turning basin.

TABLE 11

SUMMARY COMPARISON OF SELECTED PLAN BENEFITS AND COSTS

ITEMS	41 Feet
AAEQ Benefits	\$3,729,000
Costs - Interests and Amortization <u>1/</u>	892,000
Maintenance: Channel shoals <u>2/</u>	192,000
Navigation aids	3,000
Disposal area costs	124,000
Total AAEQ costs	\$1,211,000
Benefit-to-cost ratio	3.1 to 1

NOTES:

1/ The total first cost (\$11,348,000) plus IDC of \$50,000 is the total economic cost for the project. That economic cost is then amortized over 50 years at an interest rate of 7.625 percent for the AAEQ cost for all channels, turning basin, bulkhead modifications, and berthing areas.

2/ Annual costs for maintenance to remove shoals include the excavation of material from the project channels, turning basin, and berthing areas with placement in disposal island 3D.

The AAEQ costs come from interest and amortization of the total initial economic first cost and maintenance of the project in the future. More detailed discussions are in the subsequent subheadings for different elements in the maintenance costs.

Channel Maintenance. The results of the advanced maintenance analysis show the most cost efficient overdepth for maintenance is 2 feet. Removal of about 720,000 cubic yards of shoal material with that overdepth dredging is estimated to occur about once every 9 years. The estimated maintenance cost for that removal is about \$2,388,000. The present worth value of that maintenance cost every 9 years over the 50 year project life is about \$2,454,000. The estimated average annual equivalent (AAEQ) cost for that removal is \$192,000 as shown in table 11.

Dike Maintenance. Dike construction on disposal island 3D is essential for continued maintenance of the Federal navigation project for Tampa Harbor. The existing dike has little remaining capacity. The 1994 estimate of capacity was about 1,362,000 CY. Maintenance accumulations on the Tampa Harbor project without the Alafia River project is an estimated 280,000 CY a year. Disposal island 3D has about 5 years of maintenance capacity with existing dikes. An increase in dike height for more capacity is necessary by 1999 for continued maintenance of Tampa Harbor. Adding 7 feet of dike height for construction of the selected plan to deepen Big Bend will not significantly improve the disposal capacity in 3D for disposal of material from maintenance to remove shoals.

The construction equipment for raising the dike height on disposal island 3D can provide the 7 feet for the Big Bend work as well as additional height for the Tampa Harbor project. That saves the equipment mobilization cost for raising the dikes in two separate occurrences. If construction of the Big Bend deepening project does not occur before 1999, the Tampa Harbor project will likely require the higher dikes for maintenance. The likely increments for dike increases just for the Tampa Harbor project are 10 feet.

The first increment of 10 feet should be done as part of dike work for the Big Bend project. The first 7 feet is part of the Big Bend project costs and uses about 580,000 CY of material from within disposal island 3D. The estimated total material for dikes in the first 10 feet is about 1,108,000 CY which is available in disposal island 3D. Material from the Big Bend dredging will enable the construction of the last increment of 10 feet.

Dike Costs. The estimates of disposal area costs for the different increments of dike height have the same equipment mobilization and demobilization cost (\$80,000) for dike construction. The estimated costs below exclude mobilization and demobilization, preconstruction engineering and design costs, as well as construction management costs:

Dike Increment in feet	Costs (000)	
	Total	Increment
7	\$1,796	\$ 0
10	3,411	1,615
20	9,893	6,482

An additional 10 feet of dike height above the existing height adds about 5.0 million CY of capacity to disposal island 3D. That equates to about 500,000 CY a foot. To raise the existing dike height 20 feet requires the use of an estimated 1.7

million CY of suitable material from dredging the Big Bend Channel improvement. That material is still within the disposal area after the initial dredging of the Big Bend Channel. Usable capacity for maintenance of the Tampa Harbor project with the 10-foot dike increase consists of about 1.5 million CY (3 feet x 500,000 CY a foot) plus the space where about 1.1 million CY came from inside 3D to raise the dike 10 feet. That total amount is about 2.6 million CY plus whatever existing capacity was in the disposal area at the time of construction.

The maintenance cost for the Big Bend Channel project would have a portion of the overall dike cost associated with disposal island 3D. Tampa Harbor with the Big Bend Channel project and without Alafia River has a total estimated annual shoaling of about 360,000 cubic yards. The Big Bend share (80,000 cubic yards) of that maintenance is about 22.2 percent. The extended life for use of the island to dispose of maintenance material from Tampa Harbor and Big Bend Channel is about 7 to 8 years (2,600,000 CY/360,000 CY a year).

The Big Bend project provides 7 feet of the initial 10 feet of dike increase above existing levels. The remaining 3 feet is for maintenance of the modified Tampa Harbor project to include Big Bend. The cost of that 3 feet is an estimated \$1,615,000. The estimated preconstruction engineering and design costs along with the construction management costs are about \$291,000. The estimated total is \$1,906,000. The Big Bend share is an estimated \$423,000 ($\$1,906,000 \times 0.222$) for future maintenance.

The second 10 feet of dike has an estimated dike and weir costs of \$6,482,000. The estimated mobilization and demobilization, preconstruction engineering and design, and construction management costs are about \$1,247,000. The estimated total is \$7,729,000. The Big Bend portion of that dike cost for maintenance is an estimated \$1,716,000 ($\$7,729,000 \times 0.222$).

The total maintenance cost for disposal area work includes the initial cost \$423,000 for 3 feet of the initial 10 feet and \$1,715,000 about 7 years later to raise the dike another 10 feet.

The present worth value of \$1,715,000 at an interest rate of 7.625 percent is \$1,025,000. The total present worth value of the two increments is \$1,448,000. The total capacity with the 20 feet of dike is about 10.7 million CY. That capacity provides about 30 years of disposal for 360,000 CY of shoaling material a year. The average annual equivalent (AAEQ) value of \$1,448,000 over 30 years is about \$124,000. That AAEQ value is in table 11 as the amount for the estimated project life of 50 years.

The economic appendix of the report includes a discussion of risk associated with the dependence of project justification on coal movements for Big Bend station. To summarize, the selection for mode of transport concerning coal is largely dictated according to the origin or selected source, which in turn is primarily driven by total acquisition and/or delivered cost(s) and quality (i.e., sulfur and ash content, Btu output, etc.). Given consideration of air quality standards, alternatives for regulatory compliance, cost, and quality of coal available both domestically and from foreign sources, it is highly probable that TECO will continue to import foreign coal. This determination is further supported by the location of TECO's generation plant with access to a major deep-draft waterway system which makes direct water transport practical and highly cost-effective with proposed improvements. Under such circumstances, the importation of foreign coal whether from Indonesia or South America is economically facilitated via self-propelled carriers of foreign registry due to scale and costs of associated vessel operations and is competitive with domestic barge operations such as GCT as demonstrated in the report appendix. As an example, Table B-15 and B-20 of the draft report and revised appendix illustrate that the lowest cost per ton for domestic barge services is \$4.66 per short ton while review of Table B-26-b is \$4.10 or less for service by self-propelled carrier for a waterway depth of 37.0 feet or greater. The relative spread for stated costs illustrate the advantage of waterborne transport with improvements (for further information concerning preceding discussion, refer to the economic appendix for Big Bend Channel).

PLAN IMPLEMENTATION

The sponsor, the Tampa Port Authority, is in agreement with the selected plan based on recent coordination. Implementation of that plan is dependent on further review within the U.S. Army Corps of Engineers and the Secretary of the Army's Office before going to the U.S. Congress for authorization as a Federal project. Authorization enables plan implementation with the sponsor providing the necessary non-Federal cooperation items. Non-Federal responsibilities include work that requires cost sharing and some that is 100 percent sponsor cost such as berthing area dredging, bulkhead modifications, and disposal area work. The Water Resources Development Act (WRDA) of 1986 established the formula for Federal and non-Federal shares of the estimated construction cost for the general navigation features of the selected plan.

IMPLEMENTATION AUTHORITY

Senate and House Resolutions requested the study of the Big Bend Channel in 1979. Those resolutions authorized the study and this report on the findings. The normal process for a Congressional study authorization is to send a final report back to Congress for project authorization first then request funding to implement the authorized project. That process takes time as the report goes to Congress for authorization in a Water Resources Development Act. Funding to construct the project normally occurs after Congressional authorization.

NON-FEDERAL RESPONSIBILITIES

Implementation of the selected plan involves specific non-Federal responsibilities. New cost-sharing in the Water Resource Development Act of 1986 requires the non-Federal sponsor to share in the costs of general navigation features (GNF). The GNF on the Big Bend project include the:

- Entrance, east and inner channels;
- Turning basin that connects the three channels; and
- Dikes and weirs for disposal of dredged material from initial construction.

Congress included dikes and weirs as GNF for cost sharing in the Water Resources Development Act of 1996. The sponsor's share of GNF for a project with commercial navigation benefits is:

- 25 percent in cash during the period of construction for a project depth of 41 feet and
- 10 percent over 30 years provided there is no non-Federal credit for the 10 percent.

Sponsor costs for relocations, lands, easements, and right-of-way are allowable non-Federal credits. The sponsor's credit cannot exceed 10 percent of the total GNF costs. Table 12 shows the total GNF costs to be \$8,167,000 but no costs for any allowable non-Federal credits.

The berthing area dredging and bulkhead modification are 100 percent non-Federal responsibilities. Removal of shoal material on the existing non-Federal project to a required depth of 34 feet either prior to or during construction is a 100 percent sponsor responsibility and costs. The study identified no relocation nor cultural resources in the area that interferes with implementation of the selected plan. Standard cooperation agreement items of sponsor responsibility for project

implementation are in the RECOMMENDATIONS section of this report. These items are standard for any non-Federal sponsor, but they do not all apply to the proposed project. Relocation does not apply in this case and table 11 has no cost for that item. The estimated items that apply are shown in that table.

FEDERAL RESPONSIBILITIES

The authorization of a Federal project for implementation incurs certain Federal responsibilities. Those responsibilities relate primarily to the general navigation features and aids to navigation. The aids to navigation are a 100 percent Federal responsibility. The Federal responsibility for initial cost of general navigation features is 65 percent for a project depth of 41 feet if the sponsor has no 10 percent credit. The non-Federal sponsor has no credits identified for the selected plan. That leaves the Federal percentage at 65 percent. The estimated current value of Federal cost is \$5,309,000 (without the \$438,000 for navigation aids). Table 12 shows the estimated values of Federal and non-Federal costs.

Once authorization of a project occurs, the Federal Government responsibilities also involve the following:

a. Subject to and using funds provided by the sponsor and appropriated by the Congress, the Government shall expeditiously construct the general navigation features of the project (including relocations or alterations of highway and railroad bridges and approaches thereto), applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies.

b. To the extent possible, the sponsor shall be afforded the opportunity to review and comment on all:

- Contracts, including relevant plans and specifications, prior to the issuance of invitations for bids and

- Modifications and change orders prior to the issuance to the contractor of a Notice to Proceed. The Government will consider the comments of the sponsor, but contract award, modifications or change orders, and performance of all work thereunder (whether the work is performed under contract or by Government personnel) shall be exclusively within the control of the Government.

c. The Government shall operate and maintain the general navigation features (including any improvements made to Disposal Island 3D) of the project assigned to commercial navigation. Maintenance of the project is a Federal expense provided the sponsor furnishes the non-Federal responsibilities.

TABLE 12
SELECTED PLAN COST SHARING

ITEM	TOTAL COST (000)	FEDERAL SHARE (000)	NON- FEDERAL SHARE (000)
General Navigation Features (GNF)			
Channels and Turning Basin	\$4,958	\$3,223 <u>1/</u>	\$1,735 <u>2/</u>
Environmental Monitoring	87	57	30
Dike and weir construction	1,876	1,219	657
Preconstruction Eng & Design	554	360	194
Construction Management	692	450	242
Subtotal, GNF Costs	\$8,167	\$5,309	\$2,858
Features not Cost Shared			
Berthing Areas <u>3/</u>	\$517	0	\$ 517
Preconstruction Eng & Design	41	0	41
Construction Management	52	0	52
Subtotal, Berthing Areas	\$610	0	\$610
Bulkhead Modification <u>3/</u>	2,133	0	2,133
Navigation Aids	438	438	0
TOTALS	\$11,348	\$5,747	\$5,601

NOTES:

- 1/ The estimated Federal share of general navigation features is 65 percent. The non-Federal sponsor has no estimated credit.
- 2/ Non-Federal sponsor cost is a 25 percent cash contribution plus 10 percent over 30 years for a total of 35 percent of the general navigation features .
- 3/ Berthing areas dredging and bulkhead modifications are 100 percent non-Federal expenses.

FLOOD PLAIN ASSESSMENT

Executive Order 11988 requires the Federal Government to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of flood plains and to avoid direct or indirect support of flood plain development wherever there is a practical alternative. All lands within the Big Bend area current or potential supporting port facilities lie within the flood plain determined by a 100-year frequency flood elevation.

Navigation improvements at Big Bend would encourage the expansion of the existing cargo handling area. Alternative location of those facilities outside the flood plain is impractical. Also, development of additional facilities at alternative ports to handle prospective future tonnages would likely involve development within the flood plain at their respective sites.

COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act of 1972, as amended (PL 92-583) requires all Federal activities inside or outside a state's coastal zone to be consistent to the maximum extent practicable with the state's coastal zone management plan (CZMP) if the activities affect natural resources, land or water uses within the coastal zone. The State of Florida reviewed the proposed project and determined it is consistent with the State's CZMP.

COASTAL BARRIER RESOURCES ACT

The proposed new Federal investment decision for the Big Bend Channel navigation improvements does not include any recommendations which would result in any new Federal expenditures or financial assistance prohibited by the Coastal Barrier Resources Act (Public Law 97-348); nor were funds obligated in the past years for this project for purposes prohibited by this Act.

PUBLIC INVOLVEMENT

The Environmental Assessment (EA) contains letters and other pertinent correspondence that was received as a result of public and interagency meetings and coordination conducted during the study process. The draft report coordination with the public occurred between June 28 and July 29 of 1996. Comments and responses on the draft report are in the EA.

The main comment on the report was from the U.S. Department of Interior, Office of Environmental Policy and Compliance. The comment was over concerns by the Fish and Wildlife Service (FWLS) about the potential adverse effect on the manatee. The options to avoid adverse impacts were to avoid dredging during the winter months (November 15 - March 31) or provide a trained biologist, approved by the FWLS, to watch for manatees and require all service boats to have propeller guards. The latter option is a part of the selected plan for the project.

An informal public meeting on July 29 provided an opportunity for public comment. No adverse comments received from that public meeting on the draft report.

CONCLUSIONS

To consider resources in the area of the proposed improvement, plan formulation involved several alternatives. The no action plan provided nonstructural measures for future management and use of the existing facilities and navigation features to include continued maintenance of those features. Model simulation looked at the existing non-Federal channels and turning conditions to assess minimum changes needed for safe navigation. Selected plan conditions included the following:

- Entrance channel bottom width of 250 feet,
- Inner channel bottom width of 200 feet,
- East channel bottom width of 200 feet,
- An increase in the turn widener from the entrance channel to the inner channel, and
- Movement of navigation markers on the existing non-Federal channel.

Enlargement of the widener in the turn between the entrance and inner channels enables vessels to stay inside the bottom boundaries and also provides a turning diameter in the basin of 1,200 feet. Alternatives depths for deepening in all channels, the turning basin, and berthing areas ranged from 33 to 45 feet.

Formulation considered measures to avoid or minimize impacts to significant environmental resources in the area. Plan implementation includes no dredging or disposal during the migratory bird season. Concerns about the manatee resulted in the following measure to be a part of dredging contract:

- Standard Federal and State manatee protection conditions;
- Provision for a trained biologist, approved by the Fish and Wildlife Service and/or Florida Department of Environmental Regulation, to be aboard the dredge;
- No dredging at night during the winter manatee window with the use of a clamshell dredge to do the excavation; and
- Placement of propeller guards on the auxiliary vessels moving supplies and personnel between the dredge and shore.

The no action plan provided a non-structural base condition without improvement but did not meet the planning objectives. The National Economic Development (NED) plan is for a project depth of 41 feet, an advanced maintenance depth of 2 feet, and an allowable overdepth of 1 foot. The NED plan is the selected plan which minimizes overall project costs and maximizes benefits in excess of costs. Based on the study findings, that plan has a total economic first cost of \$11,348,000. The non-Federal share is \$5,601,000 which includes berthing area dredging and bulkhead modifications.

Average annual equivalent (AAEQ) benefits are \$3,729,000 from savings in transportation costs in the deep-draft vessel movements of coal, phosphate rock, and phosphate chemicals. AAEQ costs are \$1,211,000 which includes interest and amortization of the total economic first cost and future maintenance of the channel and navigation aids. An interest rate of 7.625 percent provided the basis for discounting future benefits and costs. The benefit to cost ratio is 3.1 to 1. Sufficient estimated capacity exists in disposal island 3D for over 20 years of maintenance to remove shoal material from the selected plan.

The selected plan appears to provide sufficient material for dike construction. Excess material for beneficial use to enhance the environment would not be available at the time of construction. Direct use of dredged material from deepening and widening is not advisable due to the large amount of estimated fines in that material. To separate the fines from more usable material, placement in disposal island 3D is recommended to enable a natural separation to occur. Once that separation takes place, any excess material not needed for dike construction could be considered at a later date for beneficial use to enhance the environment. Consideration and recommendation of beneficial uses of that material is possible in the future under available Congressional legislation.

The Tampa Port Authority, the project sponsor, provided a letter in support for the selected plan. That letter is in appendix G. The Tampa Port Authority indicates full support for the project and is budgeting for their cost. The sponsor is aware of the cost sharing and required items of local cooperation for project construction. Construction will be completed under one contract. The sponsor has indicated willingness and financial support for the project.

The sponsor has also requested in a letter that the U.S. Army Corps of Engineers assume all applicable responsibilities for dredged material disposal facilities required for the Big Bend Channel project and the entire Tampa Harbor Project. This report serves as the decision document for the Big Bend Channel portion.

The project cost sharing has been adjusted accordingly. The Project Cooperation Agreement will reflect the new responsibilities. A separate decision document will be prepared for the remaining Tampa Harbor portions and the existing cooperation agreement will be modified.

RECOMMENDATIONS

I recommend authorizing construction of navigation improvements and maintenance to non-Federal channels as a modification to the Tampa Harbor project in accordance with the plan selected herein, which is the National Economic Development Plan, with such modifications as in the discretion of the Commander, HQUSACE, may be advisable; at a first cost to the United States presently estimated at \$5,842,000, with annual operation and maintenance costs of \$255,000 to the United States.

These recommendations are made with the provision that the exact amount of non-Federal contribution shall be determined by the Commander, HQUSACE prior to project implementation, in accordance with the following required items of cooperation to which the non-Federal sponsor (Tampa Port Authority) shall agree to perform prior to implementation:

a. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, the local service facilities in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

b. Provide all lands, easements, and rights-of-way, including those lands, easements, and rights-of-way required for dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features (including all lands, easements, rights of way, and relocations necessary for dredged material disposal facilities);

c. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

d. Provide, during the period of construction, a cash contribution equal to 25 percent of the total cost of construction of the general navigation features (which include the construction of land based and aquatic dredged material disposal facilities that are necessary for the disposal of dredged material required for project construction, operation, or maintenance and which a contract for the facility's construction or improvement was not awarded on or before October 12, 1996) for costs attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet;

e. Repay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, an additional 10 percent of the total cost of construction of general navigation features depending upon the amount of credit given for the value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

f. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the general navigation features for the purpose of inspecting, and, if necessary, for the purpose of operating, maintaining, repairing, replacing, and rehabilitating the general navigation features;

g. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project and any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

h. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of construction of the general navigation features, and in accordance with the standards for financial management system set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 CFR, Section 33.20;

i. Perform, or cause to be performed, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, and maintenance, repair, replacement, or rehabilitation of the general navigation features. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigation unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

j. Assume complete financial responsibility, as between the Federal Government and the non-Federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features;

k. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;

l. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR, Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

m. Comply with all applicable Federal and State laws and regulations, including, but not limited to, section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army;" and

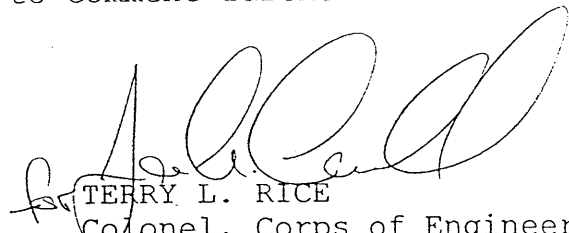
n. Provide a cash contribution equal to 25 percent of the total historic preservation mitigation and data recovery costs attributable to commercial navigation that are in excess of 1 percent of the total amount authorized to be appropriated for commercial navigation;

o. Enter into an agreement which provides, prior to construction, 25 percent of preconstruction engineering and design (PED) costs.

The sponsor furnishes the above assurances during the development of plans and specifications after the project has been authorized for construction.

In agreeing to the assurances, the sponsor incurs several obligations. The most prominent ones involve the responsibility for a cash contribution equal to twenty-five (25) percent of the costs for general navigation features prior to advertisement of the project for bids and the liability for cleanup costs of hazardous materials located on submerged project lands. At this time, there are no known hazardous or toxic materials located on the submerged project lands or in local berthing areas.

The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to Congress as proposals for implementation funding. However, prior to transmittal to the Congress, the sponsor, the State, interested Federal agencies, and other parties will be advised of any modifications and will be afforded the opportunity to comment further.



TERRY L. RICE
Colonel, Corps of Engineers
Commanding

JAMES A. CONNELL
LTC, Corps of Engineers
Deputy Commander

**ENVIRONMENTAL ASSESSMENT
AND FINDING OF NO SIGNIFICANT IMPACT (FONSI)**

**TAMPA HARBOR - BIG BEND CHANNEL
NAVIGATION IMPROVEMENTS**

